

Patent Claims

1. A device for driving a coolant pump (2) for the coolant circuit of an internal combustion engine for a motor vehicle or of other accessories, having a drive train comprising a drive wheel (7), a fluid friction clutch (11) and a drive shaft (3), characterized by a second clutch (15) which is designed as a release clutch and can be connected into the drive train parallel to the fluid friction clutch (11).
2. The device as claimed in claim 1, characterized in that the release clutch is designed as an electromagnetic clutch (15).
3. The device as claimed in claim 1 or 2, characterized in that the fluid friction clutch (11) and the electromagnetic clutch (15) each have a driving disk (9, 10; 9', 10') which can be driven by the drive wheel (7) and are fastened on the drive shaft (3b, 23, 25a) on both sides of a web (7b) of the pulley (7).
4. The device as claimed in claim 3, characterized in that driving disk (9, 9') of the fluid friction clutch (11, 11') is arranged rotatably in a working space (13) which is formed by the drive wheel (7), the web (7a) thereof and a cover (12, 27) and is filled with viscous fluid.
5. The device as claimed in claim 3 or 4, characterized in that the electromagnetic clutch (15) has a positionally fixed magnet coil (16, 17), magnetic-flux-guiding rings (19) connected to the pulley (7) and a magnet armature (20) which is connected in an axially movable, but rotationally fixed manner to the driving disk (10) via leaf springs (21).
6. The device as claimed in one of claims 1 to 5,

characterized in that the drive shaft (3, 25) is mounted rotatably in a bearing housing (5) which has a coolant pump impeller (2) fastened to its driven shaft end (3a) and the driving disks (9, 10; 9', 10')
5 fastened to its driving end (3b; 25a, 23).

7. The device as claimed in claim 6, characterized in that the electromagnetic clutch (15) is arranged between the pulley (7) and coolant pump impeller (2)
10 and the magnet coil (16, 17) is fastened to the bearing housing (5).

8. Device according to one of claims 1 to 7, characterized in that the drive wheel is designed as a
15 pulley (7) and, together with the fluid friction clutch (11') and the rotating (not positionally fixed) part of the electromagnetic clutch (15), is designed as a drive unit (22) which is preassembled and can be plugged onto the drive shaft (25, 25a).

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9. The device as claimed in claim 8, characterized in that the drive unit (22) is mounted on a hollow shaft (23) and is connected to the drive shaft (25a, 25) via the hollow shaft (23) by means of a central screw bolt
25 (24).

10. A method for controlling the speed of rotation of a coolant pump for the coolant circuit of an internal combustion engine of a motor vehicle, the coolant pump
30 being driven (mechanically) by the internal combustion engine via a belt drive, characterized in that the coolant pump (2) is driven in a first stage at a reduced speed of rotation and in a second stage at a non-reduced speed of rotation, and in that switching
35 over from one stage to the other takes place as a function of parameters of the internal combustion engine.

11. The method as claimed in claim 10, characterized in that the switching over from stage 1 to stage 2 takes place when a limit value for the following parameters is exceeded:

5 coolant temperature,
engine oil temperature,
engine torque (load moment),
ratio of engine power to coolant temperature,
ratio of engine power to speed of rotation of the
10 engine.

12. The method as claimed in claim 10 or 11, characterized in that the switching over from stage 2 to stage 1 takes place when a limit value for the speed
15 of rotation of the engine is exceeded.